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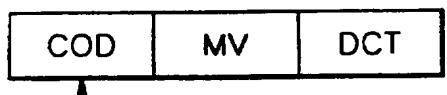
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(54) Abstract Title

Representation of type of coded information in coded video data

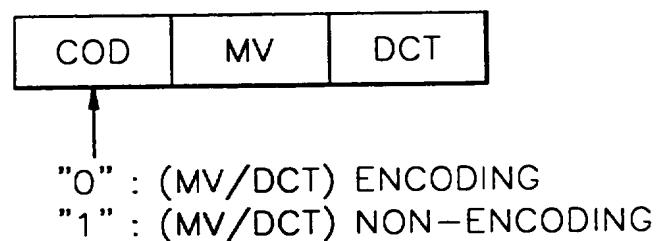
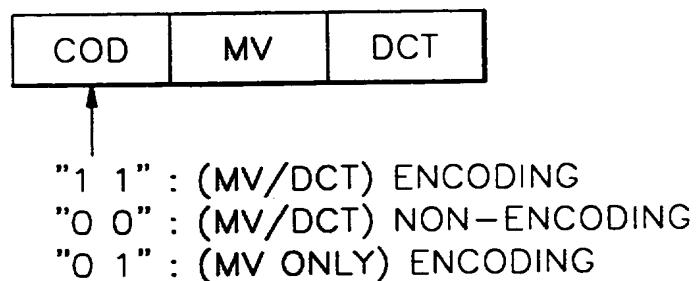
(57) A method for representing encoding or non-encoding of video information. In this method, an image is encoded by extending a code (COD) field which is used in H.263 and MPEG-4 to comprise at least two bits. Conveniently the two bit format indicates the cases where neither a motion vector (MV) nor a discrete cosine transform (DCT) value are encoded, where both the MV and the DCT value are encoded, and where only the MV is encoded. Therefore, in a channel with errors, the extended OCD field can be used in the error allowable mode. Also, video information can be encoded using fewer bits than in the prior art where the motion of an image is constant.

FIG. 2



"1 1" : (MV/DCT) ENCODING
"0 0" : (MV/DCT) NON-ENCODING
"0 1" : (MV ONLY) ENCODING

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FIG. 1 (PRIOR ART)**FIG. 2**

METHOD FOR REPRESENTING ENCODING
UPON CODING VIDEO INFORMATION

The present invention relates to a method for coding 5 video information, and more particularly, to a method of representing encoding or nonencoding by extension of a video information field. Furthermore, the present invention relates to a method of reducing the amount of video bits, by which a method of representing encoding or 10 non-encoding by the extension of an information field for representing encoding or non-encoding can be applied to an error allowable mode, and by which the amount of bits depending on the characteristics of video information to be coded can be reduced.

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In case of a block-based codec, an object-based codec, or a shape-based codec, a general technique for encoding a moving picture is as follows. A motion vector being the most similar to a current block in a previous 20 frame, and a real value or a modified value (e.g., DCT) with respect to the difference between real data are encoded to produce data, so that a block is encoded.

In H.263 and MPEG-4, a "COD (code)" field is used to 25 see whether these two characteristic values are encoded in bit stream.

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Figure 1 is a concept view showing a method of representing encoding and non-encoding in a general bit stream.

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As shown in Figure 1, whether a motion vector MV and a DCT coefficient are encoded or not is represented by a one-bit value of a COD field. That is, if the bit of the COD field is "0", it indicates that the MV and the DCT are

encoded, but if the bit thereof is "1", it indicates that they are not encoded.

5 However, when encoding or non-encoding of a block is reported by using the COD field, this information is represented by only one bit. Thus, in some cases when this one bit is used in a channel having an error, the entire information is easily misinterpreted by only the error of one bit.

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Also, in the case of an image motion on a predetermined background, only motion vector (MV) is required during actual encoding and the difference value (DCT) is not needed. In the conventional technique, the 15 difference value (DCT) is also encoded to thereby cause the amount of bits to increase.

20 An aim of the present invention is to provide a method of representing encoding upon encoding video information, by which misinterpretation can be reduced when video information is transmitted in a channel with an error.

25 Another aim of the present invention is to provide a method of representing encoding upon encoding video information, by which data, obtained by encoding the motion of an image is smaller than in the conventional art with respect to constant video motion information.

30 According to the present invention there is provided a method for representing encoding when video information is coded, characterized in that an image is encoded by extending a code (COD) field which is used in a bit stream to indicate the cases where neither a motion vector (MV) 35 nor a discrete cosine transform (DCT) value are encoded,

where both the MV and the DCT value are encoded, and where only the MV is encoded.

5 Preferably, said extended code field comprises at least two bits.

Preferably, said extended code field is used in H.263 or MPEG-4 encoding standards.

10 Preferably, when the COD field has a bit value of "1 1", it indicates that neither the MV nor the DCT value are encoded, when the COD field has a bit value of "0 0", it indicates that both the MV and the DCT are encoded, and when the COD field has a bit value of "0 1", it indicates 15 that only the MV is encoded.

Preferably, when an error exists in a channel, only the two values of "00" and "11" are used in an error allowable mode.

20 Preferably, when packetized data is divided and transmitted in the error allowable mode, the number of "1" of the COD field in a packet is encoded using variable length coding (VLC) and transmitted before the COD field 25 without transmitting the original COD, and when the combined code has a bit value of "0 0", "0" is transmitted, and when the combined code has a bit value of "1 1", "1" is transmitted, and in the cases of the other combinations, the original codes of VLC and COD are 30 transmitted without change.

Preferably, information is encoded by using only MV, under the background in which the motion of an image is regular.

For a better understanding of the invention, and to show how embodiments of the same may be carried into effect, reference will now be made, by way of example, to the accompanying diagrammatic drawings, in which:

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Figure 1 is a schematic view showing a method for representing encoding and non-encoding in a general bit stream; and

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Figure 2 is a schematic view showing a method for representing encoding and non-encoding in a bit stream according to a preferred embodiment of the present invention.

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As shown in Figure 2, extension of one bit in a COD field results in a reduction in the possibility of decoding erroneous COD information, and generation of data encoded in a smaller amount than the conventional art with respect to an image which can sufficiently represent 20 information by using only a motion vector. That is, the COD field represents not only the encoding or non-encoding of two representative values but also a case when only a motion vector, among the two representative values, is required. For this, the COD field is 2 bit-tabled. That 25 is, for example a value "1 1" indicates that neither MV nor DCT is encoded, "0 0" indicates that both the MV and DCT are encoded, and "0 1" indicates that only the MV is encoded. Here, we can recognize that "1 0" may indicate that only the DCT is encoded, but this option is not used 30 in this embodiment.

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When a video codec performs encoding in an error allowable mode via this expression of the COD, only two values of "0 0" and "1 1" are used to prevent defective transmission of "0 1". In this way, misinterpretation is

less likely to occur in the channel with errors than the case of representing the COD in one bit.

Also, when a piece of packetized data is divided and transmitted in the error allowable mode, the following method can be used. That is, the number of "1" of COD in a packet is encoded using variable length coding (VLC) and transmitted before COD. Here, when the combined codes are both expressed by "00", "0" is transmitted, and when those are expressed by "11", "1" is transmitted. The original COD is not transmitted. In the residual cases, the original codes of VLC and COD are transmitted without change. Thus, the information field of the COD is extended to be more robustly applied to the error allowable mode.

The present invention is not limited to the above-described embodiment, and it is apparent that modifications may be effected by those skilled in the art within the spirit of the present invention. For example, it is apparent to those skilled in the art that the COD field can be expressed by 2 bits or more in the method of representing encoding when coding video information. Also, determination of a channel with errors, and determination of whether an image moves under a constant background, are obvious to those skilled in the art, so they will not be described in detail. Here, these two determinations are applied to the method of representing encoding when coding video information.

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According to the present invention as described above, in a channel with errors, a COD field is extended, and the extended COD field can be used in an error allowable mode. Also, video information can be encoded in

a smaller amount of bits under the background where an image makes a regular movement, than the conventional art.

5 The reader's attention is directed to all papers and documents which are filed concurrently with or previous to this specification in connection with this application and which are open to public inspection with this specification, and the contents of all such papers and documents are incorporated herein by reference.

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All of the features disclosed in this specification (including any accompanying claims, abstract and drawings), and/or all of the steps of any method or process so disclosed, may be combined in any combination, 15 except combinations where at least some of such features and/or steps are mutually exclusive.

20 Each feature disclosed in this specification (including any accompanying claims, abstract and drawings), may be replaced by alternative features serving the same, equivalent or similar purpose, unless expressly stated otherwise. Thus, unless expressly stated otherwise, each feature disclosed is one example only of a generic series of equivalent or similar features.

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30 The invention is not restricted to the details of the foregoing embodiment(s). The invention extends to any novel one, or any novel combination, of the features disclosed in this specification (including any accompanying claims, abstract and drawings), or to any novel one, or any novel combination, of the steps of any method or process so disclosed.

CLAIMS

1. A method for representing encoding when video information is coded, characterized in that an image is 5 encoded by extending a code (COD) field which is used in a bit stream to indicate the cases where neither a motion vector (MV) nor a discrete cosine transform (DCT) value are encoded, where both the MV and the DCT value are encoded, and where only the MV is encoded.
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2. The method of claim 1, wherein said extended code field comprises at least two bits.
3. The method of claim 1 or 2, wherein said extended 15 code field is used in H.263 or MPEG-4 encoding standards.
4. The method of claim 1, 2 or 3 wherein when the COD field has a bit value of "1 1", it indicates that neither the MV nor the DCT value are encoded, when the COD field 20 has a bit value of "0 0", it indicates that both the MV and the DCT are encoded, and when the COD field has a bit value of "0 1", it indicates that only the MV is encoded.
5. The method of claim 4, wherein when an error exists 25 in a channel, only the two values of "00" and "11" are used in an error allowable mode.
6. The method of claim 5, wherein when packetized data is divided and transmitted in the error allowable mode, 30 the number of "1" of the COD field in a packet is encoded using variable length coding (VLC) and transmitted before the COD field without transmitting the original COD, and when the combined code has a bit value of "0 0", "0" is transmitted, and when the combined code has a bit value of 35 "1 1", "1" is transmitted, and in the cases of the other

combinations, the original codes of VLC and COD are transmitted without change.

7. The method of claim 4, wherein information is encoded
5 by using only MV, under the background in which the motion
of an image is regular.

8. A method for representing encoding, substantially as
hereinbefore described.

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9. A method for representing encoding, substantially as
hereinbefore described with reference to Figure 2 of the
accompanying drawings.



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Claims searched: All

Examiner: Joe McCann
Date of search: 26 March 1999

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.Q): H4F(FRG)

Int Cl (Ed.6): H04N(7/50);G06T(9/00)

Other: Online: WPI, PAJ, EPODOC, INSPEC, INTERNET

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
	None	

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.